an active material in operative communication with the end of the wire or strip, wherein the active material is effective to undergo a change in at least one attribute in response to an activation signal, wherein the change in the at least one attribute exerts the force on the wire or strip such that a shape of the seal body changes in response to a force exerted on the wire or strip;

an activation device in operative communication with the active material adapted to provide the activation signal; and

a controller in operative communication with the activation device.

2. The active seal assembly of claim 1, wherein the wire or strip rotates in response to the activation signal to decrease a cross sectional diameter of the seal body.

3. The active seal assembly of claim 1, wherein the active material comprises shape memory alloys, ferromagnetic shape memory alloys, shape memory polymers, electroactive polymers, magnetorheological elastomers, piezoelectric materials, composites of one or more of the foregoing materials with non-active materials, and combinations comprising at least one of the foregoing materials.

4. The active seal assembly of claim 1, wherein the stiffening elements are formed of the active material.

5. The active seal assembly of claim 1, wherein the wire or strip is centrally disposed within the hollow interior channel.

6. The active seal assembly of claim 1, wherein the stiffening elements form an exoskeleton of the seal body.

7. An active seal assembly, comprising:

a seal body formed of an elastic material integrated with a seal base, wherein the seal body comprises a hollow interior channel;

an active material fluid disposed within the hollow interior channel, wherein the active material is effective to undergo a change in at least one attribute in response to an activation signal, wherein the change in the at least one attribute changes a shape of the seal body;

an activation device in operative communication with the active material adapted to provide the activation signal; and

a controller in operative communication with the activation device.

8. The active seal assembly of claim 7, wherein the seal body comprises an outer resilient contact surface and inner hard core that collectively defines the hollow interior channel.

9. The active seal assembly of claim 7, wherein the hollow interior channel is intermediate at least two rigid bodies extending along the length of the seal body, wherein the hollow interior channel includes a portion that extends laterally beyond the at least two rigid bodies.

10. The active seal assembly of claim 7, wherein the active material fluid comprises and electrorheological fluid or a magnetorheological fluid.

11. The active seal assembly of claim 7, wherein the hollow interior channel is in fluid communication with a piston, wherein the active material is in operative communication with the piston to effect movement thereof.

12. The active seal assembly of claim 7, wherein the seal body comprises a solid active material selected from the group consisting of a shape memory alloy, a ferromagnetic shape memory alloy, a shape memory polymers, an electroactive polymer, a magnetorheological elastomer, a piezoelectric material, a composite of one or more of the foregoing materials with a non-active material, and a combination comprising at least one of the foregoing materials.

13. An active seal assembly comprising:

a seal body;

a movable element disposed to slide within the seal body, wherein the movable element comprises an active material adapted to selectively move the movable element from a first position to a second position in response to an activation signal and change a shape of the seal body;

an activation device in operative communication with the active material adapted to provide the activation signal; and

a controller in operative communication with the activation device.

14. The active seal assembly of claim 13, wherein the active material comprises a shape memory alloy.

15. The active seal assembly of claim 14, further comprising a bias spring in operative communication with the moveable element to bias the movable element from the second position to the first position.

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